

# Fish Technology Centers

## *Directory*



# Fish Technology Centers

## Technical Expertise

Expertise	Abernathy	Bozeman	Dexter	Lamar	Mora	San Marcos	Warm Springs
Culture techniques	★	★	★	★	★	★	★
Broodstock management	★	★	★	★	★	★	★
Health & INADs	★	★	★	★			★
Disease diagnostics	★	★		★	★		★
Nutrition & feeds	★	★	★	★	★	★	★
Aerating & oxygen	★	★	★	★	★	★	★
Transport & handling	★	★	★	★	★	★	★
Water quality	★	★		★	★	★	
Water reuse	★	★		★	★	★	★
Fishery biology & life history	★	★	★	★	★	★	★
T&E species management		★	★	★	★	★	★
Genetic management	★		★	★	★		★
Population genetics	★		★	★			
Habitat analysis				★			★
Technology transfer	★	★	★	★	★	★	★
Aquatic plant management						★	
Invertebrate culture						★	
Amphibian culture						★	

# Fish Technology Centers

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# Background

Fish Technology Centers were established in 1965 to provide leadership and guidance to the fish culture community. Over the years, fish culture studies focused on reducing costs, enhancing fish quality, and improving overall fish culture operations. The importance of Fish Technology Centers became clear as fishery managers became increasingly aware of the need to produce fish that are healthy, genetically diverse, and well-adapted to fishery management objectives.

Correspondingly, Fish Technology Center roles and responsibilities have grown, and areas of specialty have expanded to include technical support to fishery resource programs such as interjurisdictional fishes, estuarine and riverine fishes, control of nonindigenous aquatic nuisance species, threatened and endangered species, and other high priority aquatic resource issues. To accomplish their work, each Fish Technology Center now maintains at least two areas of technical expertise. Functioning as a cohesive system, each Technology Center strengthens the others, taking full advantage of various geographic differences to ensure that study results will successfully support a broad range of users. Through their partnership role with other Service programs and federal agencies, States, tribes, and the private sector, Fish Technology Centers provide a vital link in the Service's commitment to conservation of our nation's aquatic resources.





# *Abernathy Fish Technology Center*



*Top left: Tule Fall Chinook spawning in Abernathy Creek, Longview, WA. Photo: Joe Zydlewski, volunteer. Top right: Ann Gannam, Nutritionist, analyzing feed with bomb calorimeter. Bottom left: Collecting juvenile wild Steelhead to rear as wild broodstock. Bottom right: Jeff Poole and Mike Lucero examining fish for ripeness. All photos USFWS*

# *Abernathy Fish Technology Center*

## **Areas of Specialization:**

### **Behavioral Physiology**

- Evaluation of natural rearing practices
- Characteristics of smoltification and juvenile migration
- Hatchery evaluation and monitoring

### **Fish Culture**

- Use of native broodstock to restore declining populations
- Specialized culture techniques and methodology

### **Nutrition**

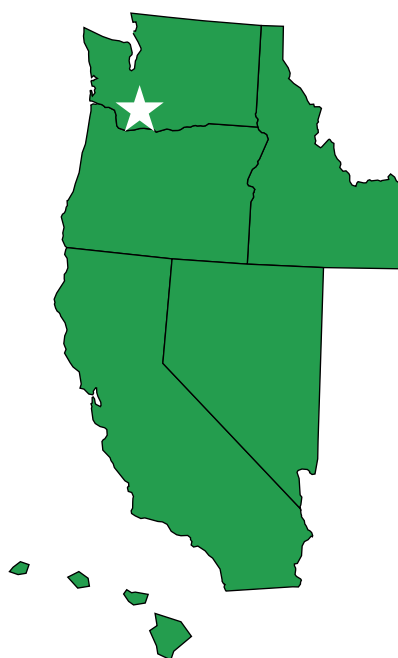
- Quality assurance of hatchery feeds
- Life-stage specific diet development
- Diets for captive broodstock programs

### **Genetics**

- Technical assistance in Endangered Species Act determinations
- Genetic analyses and monitoring
- Genetic protocols and policies

### **Pathology**

- Innovative techniques to detect and treat diseases and pathogens
- Immunology
- Disease treatments protocols



# *Abernathy Fish Technology Center*

## **Objectives**

- To conduct applied research for recovery and restoration of Pacific salmon, sturgeon, cutthroat trout, rainbow trout/steelhead, and lamprey
- To provide technical expertise in genetics, fish propagation techniques, nutrition, pathology, and behavioral physiology to benefit culture of declining, threatened and endangered species
- To develop new and innovative fish culture technologies to produce quality fish for conservation and management programs
- To provide leadership in the management of fishery resources through the assessment and evaluation of hatchery products
- To work with various federal and state agencies, tribal, sport, and conservation groups to provide fishery resources for the present and the future

## **Address**

Street Address: U.S. Fish and Wildlife Service  
Abernathy Fish Technology Center  
1440 Abernathy Creek Road.  
Longview, WA 98632

Mailing Address: U.S. Fish and Wildlife Service  
Abernathy Fish Technology Center  
1440 Abernathy Creek Road.  
Longview, WA 98632

Telephone: 360/425 6072

Fax: 360/636 1855

Web Address: <http://www.r1.fws.gov/aftc>



# *Abernathy Fish Technology Center*

## **Center Director**

- Program management/development
- Hatchery/wild salmon studies and evaluations
- Genetic considerations in aquaculture
- Adaptations, behavior, and life history theory

## **Assistant Center Director**

- Program management/development
- Personnel management and development
- Statistical applications and consultations

## **Geneticist**

- Population genetics
- Conservation of genetic resources
- Genetic monitoring and evaluations
- Genetic management of fishery resources

## **Biostatistician**

- Experimental and sampling design
- Statistical applications and consultations
- Data analyses

## **Nutritionist**

- Fish nutrition
- Diet development
- Biochemistry
- Fish feed contaminants

## **Behavioral Physiologist**

- Fish physiology
- Olfactory cues for migration
- Physiological traits of smoltification
- Hatchery/wild salmon studies

## **Microbiologist**

- Fish diseases/immunology
- Microbiology
- INAD Coordinator

## **Chemist**

- Water quality/chemistry
- Fish feed and tissue analyses
- Regional Environmental Compliance Inspection Team

## **Fishery Biologist**

- Sturgeon culture
- Salmonid culture
- Wild broodstock propagation technology development

## **Extruder Operator**

- Fish feed production
- Fish culture
- Operation and maintenance of fish feed extruder

## **Computer Assistant**

- Hardware/software technical support
- Network operation and maintenance
- Website and Internet access maintenance



# Bozeman Fish Technology Center



Top left: Jim Bowker, INAD group mixing chemicals. Top right: Pat Dwyer (foreground) electrofishing. Bottom left: Rick Barrows and feed making equipment. Bottom right: Bob Koby using the spectrophotometer to measure minerals in diets and tissue. All photos USFWS

# Bozeman Fish Technology Center

## Areas of Specialization:

### Fish Culture

- Culture of imperiled species
- Cost effectiveness of hatcheries
- Development of captive broodstocks
- Fish hatchery design
- Water quality management
- Water disinfection technology

### Evaluation

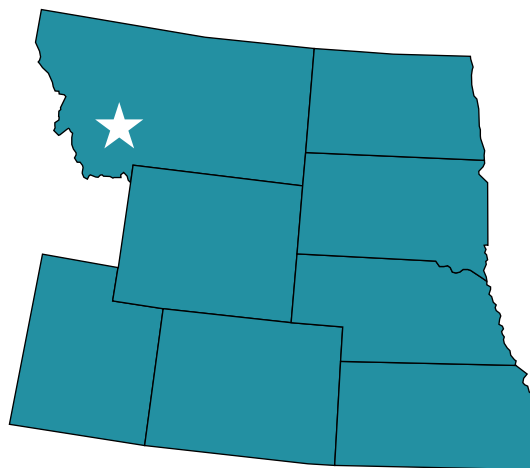
- Fishery management techniques
- Behavioral interactions between species
- Fish growth and survival
- Marking and tagging methods
- Fish passage surveys and evaluation
- Deterrents for invasive species

### Fish nutrition

- Development of fish feeds for imperiled species
- Fish food manufacturing technology and quality assurance
- Diet testing
- Pollution reduction and special larval feeds
- Feed coatings with stimulants or attractants

### Fish health

- Histopathology
- Diseases of wild and hatchery fish
- National INAD Office
- Aquaculture drug registration
- Drug delivery methods



# Bozeman Fish Technology Center

## Objectives

- To conduct applied research for recovery of listed species and restoration of species of special concern
- Scientific support for U.S. Fish and Wildlife Service operational programs in areas of Center expertise
- Diet testing, feed development, feed quality control, histopathology, fish health, and fish culture for imperiled fish species
- Development of maintenance and/or propagation techniques and system for imperiled species
- Development of techniques to instill wildness and maintain quality of propagated fish species
- House the Fish and Wildlife Service National Investigational New Animal Drug (INAD) field office. Evaluate efficacy and target animal safety of therapeutic drugs. The INAD laboratory is compliant with Good Laboratory Practices procedures
- Strive to register chemotherapeutants, anesthetics, and spawning hormones for use in hatcheries and wild fish
- Develop a national network with federal, state, tribal, and private agencies for use of drugs and chemicals in fish hatcheries, and host an annual INAD Workshop
- Provide technical assistance to pallid sturgeon, bull trout and Arctic grayling Recovery Teams and restoration efforts and for conservation plans related to species of special concern
- Test effects of pathogens and parasites on wild fish populations
- Disseminate technical information to federal and state agencies and the private sector through scientific journals, Bozeman Information Leaflets, and presentations at professional meetings and workshops

## Address

Street Address: Bozeman Fish Technology Center  
4050 Bridger Canyon Road  
Bozeman, MT 59715

Mailing Address: Bozeman Fish Technology Center  
4050 Bridger Canyon Road  
Bozeman, MT 59715

Telephone: 406/587 9265  
Fax: 406/586 5942  
Email: bill\_krise@fws.gov





# *Bozeman Fish Technology Center*

## **Technical Staff and Expertise**

### **Center Director**

- Administration and program development
- Station outreach
- Hatchery operations
- Stress and reproductive physiology

### **Assistant Center Director**

- Administration, maintenance and advocacy
- Intensive production fish culture
- Hatchery water management, oxygen supplementation, water reuse
- Hatchery design and development
- Use of ultrasound for delivery of compounds to fish

### **Fish Nutrition**

- Diet development and testing
- Feed manufacturing/technology
- Low pollution feeds
- Larval fish culture and nutrition
- Effects of metals in diets

### **Fish Culture and Management**

- Fishery management
- Fish culture and health
- Recovery and restoration of imperiled species
- Techniques for removal of non-indigenous species
- Fish passage issues

### **Histopathologist**

- Histopathology and histologic techniques
- Fish disease diagnosis, including PCR techniques
- Fish health management
- Whirling disease in wild fish

### **Hatchery Manager**

- Intensive and extensive culture techniques
- Larval culture
- Water reuse systems
- Public outreach
- Maintenance and facility management

### **National INAD Coordinator**

- FDA liaison
- Coordinate FWS and national INAD program activities
- INAD procedures
- Reproductive physiology

### **Assistant INAD Coordinator**

- INAD principal regional coordinator, Region 6
- Aquaculture drug registration data collection

### **Fishery Biologist, INAD office**

- Statistical analyses and experimental design
- Aquaculture drug registration data collection

### **General Biologist**

- Water quality management
- Effluent management
- Feed analysis and quality control

### **Fishery Biologist, INAD office**

- INAD database coordinator

# *Dexter Fish Technology Center*



*Top left: Pupfish. Top right: Larvae rearing tanks.  
Bottom left: Circular fish tanks. Bottom right: Laboratory. All photos USFWS*

# *Dexter Fish Technology Center*

## **Areas of Specialization:**

### **Fish Culture Development**

- New propagation strategies, systems, practices, methods, and technologies
- New applications of existing methods and technologies
- Identify factors limiting performance and improve culture environments
- Identify critical ecological and life history requirements
- Diet testing
- Gamete storage and cryopreservation.
- Product and performance testing and evaluation
- Fish marking and tagging
- Water conservation and reuse

### **Endangered Species Recovery**

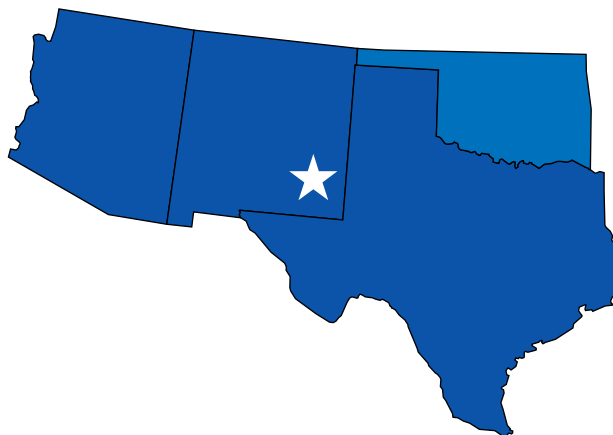
- Refugia program management
- Genetics conservation program management
- Controlled fish propagation and reintroduction program management
- Recovery planning, implementation, and evaluation
- Recovery-directed studies and experiments
- Public education and outreach
- Information and technology transfer and training

### **Ecosystem Management**

- Upper/Middle Rio Grande
- Lower Rio Grande
- Pecos River
- Upper and Lower Colorado River
- San Juan River
- Gila/Salt/Verde Rivers

### **Genetic Conservation and Management**

- Gene pool maintenance program
- Genetic analyses—stock identification, characterization, monitoring, and evaluation
- Genetic status and trend assessments
- Artificial genetic refuge populations
- Production broodstock
- Breeding, rearing, maintenance, and reintroduction strategies
- Genetic hazard and risk assessments
- Short-term and long-term gamete storage
- Genetic studies—effects of inbreeding, outbreeding, drift, selection, hybridization, and domestication on genetic resources
- Performance testing
- Develop, implement, and evaluate genetic conservation plans, strategies, practices, methods, protocols, and technologies





# *Dexter Fish Technology Center*

## **Objectives**

- Prevent imminent extinction of imperiled aquatic species
- Genetically identify and characterize imperiled native fishes of the Southwest
- Develop and maintain artificial genetic refuge populations and captive broodstocks for threatened, endangered, and otherwise imperiled native fishes of the Southwest.
- Develop and maintain Regional imperiled fish genetic resources data base
- Plan, implement, and evaluate broodstock management plans for all species maintained at Dexter
- Develop propagation strategies that promote genetic conservation, improve performance, and minimize genetic and ecological risks associated with controlled propagation activities
- Develop, test, evaluate and apply principles, practices, methods, protocols, and technologies that conserve unique genetic resources and promote successful implementation of controlled propagation strategies
- Inform and educate the public of the value and threats to their natural wildlife and fisheries resources

## **Address**

Street Address: Dexter National Fish Hatchery & Technology Center  
7116 Hatchery Road off of State Hwy 190  
Dexter, NM 88230

Mailing Address: Dexter National Fish Hatchery & Technology Center  
PO. Box 219  
Dexter, NM 88230

Telephone: 505/734 5910

Fax: 505/734 6130

CC:MAIL: R2FFA\_DX



# *Dexter Fish Technology Center*

## **Technical Staff and Expertise**

### **Center Director**

- Administration and program development
- Station outreach
- Hatchery operations

### **Assistant Center Director**

- Warmwater, coldwater, and endangered fishes
- Endangered fish culture and propagation
- Hormonal spawning of fishes
- Use of therapeutants for controlling diseases

### **Research Leader, Geneticist/Fish Culturist**

- Genetic conservation and management of natural and captive threatened, endangered and otherwise imperiled native fish populations including genetic refuge populations, broodstocks, and fish propagated for specific restoration and recovery purposes
- Genetic management in propagation and reintroduction program planning, implementation, evaluation, and coordination
- Integrated propagation management systems design
- Developing, testing, evaluating, and applying new propagation systems, strategies, practices, protocols, and technologies to improve performance of hatchery produced fish in recovery, conservation, and management programs

### **Molecular Ecology Lab Manager, Fisheries Biologist/Geneticist**

- Genetic conservation and management of threatened, endangered, and otherwise imperiled native fish populations
- Genetic analyses of natural and wild fish populations
- Develop, evaluate, test, and apply new genetic technologies to identify, characterize, evaluate, and understand genetic diversity in natural and hatchery fish populations
- Monitor, evaluate, and manage genetic impact of hatchery fish introductions
- Develop genetic profiles and data bases for individual broodfish, broodfish populations, and progeny

### **Fisheries Biologist/Culturist**

- Hatchery and broodstock management
- Develop and apply new fish culture methods and technologies for genetics conservation and propagation purposes
- Spawn, rear, and maintain threatened, endangered, and otherwise imperiled native fishes
- Water quality and reuse systems design and operations
- Fish health management

# *Lamar Fish Technology Center*



*Top left: Extracting milt from Atlantic sturgeon in Hudson River. Top right: American eel elver marked with calcein. Bottom left: Outreach at a sportsman's show. Bottom right: Atlantic sturgeon juveniles. All photos USFWS*



# *Lamar Fish Technology Center*

## **Areas of Specialization:**

### **Fish Culture**

- Threatened and endangered species
- Compatible with wild populations
- Coldwater, coolwater, warmwater
- Saltwater recirculation
- Broodstock management

### **Evaluation**

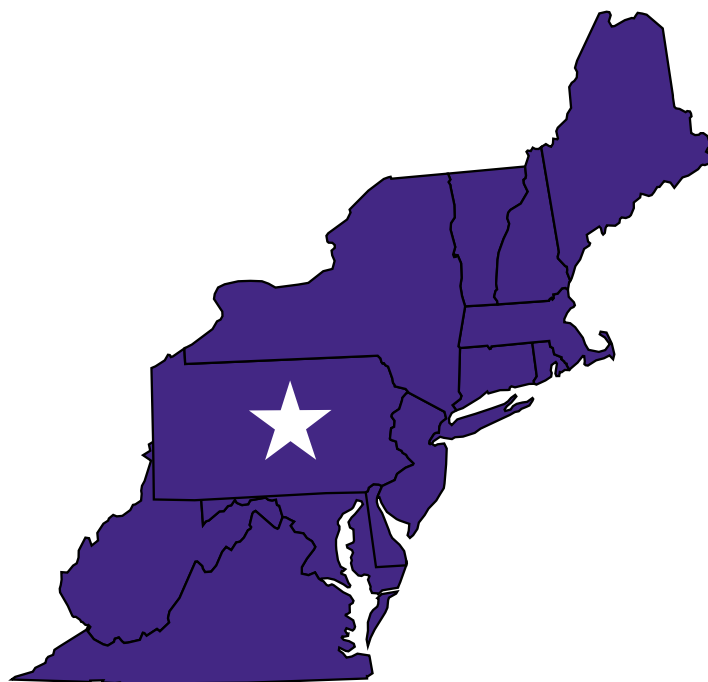
- INAD applications, investigations, monitoring
- Experimental design
- Statistical analysis
- Hatchery product evaluation
- Marking and tagging
- Population dynamics
- Genetic characterization

### **Technology transfer**

- Problem solving
- Applied research

### **Fish Health**

- Hatchery inspections
- Disease diagnostics
- Wild population sampling



# *Lamar Fish Technology Center*

## **Objectives**

- Culture and management techniques for threatened, endangered, and other imperiled aquatic species to ensure functional and genetic compatibility of propagated species with existing wild populations
- Technical assistance for implementation of approved management plans for interjurisdictional fisheries, including developing methodology to evaluate hatchery products
- Present scientific findings to the fisheries community in scientific journals, special Center publications, workshops, scientific meetings, trade shows, and Service training schools
- Population assessment for interjurisdictional aquatic species
- Fish culture technical assistance to aquaculturists in the Federal, State, tribal, and private sectors
- Evaluate alternative, cost effective methods of water use and reuse that will conserve water resources and are compatible with propagation of threatened, endangered, and imperiled aquatic species
- Conduct fish health sampling on wild populations to determine the presence of pathogens and to ascertain their impact
- Contain the spread of fish pathogens by participating in the development of a national fish health policy and by being active in Regional Fish Health Compacts that include State and private sector representatives
- Monitor the health of fish populations at Federal Fish Hatcheries in the Northeast Region by conduction inspections, performing diagnostics, and recommending treatment

## **Address**

Street Address: Northeast Fishery Center  
308 Washington Avenue  
Lamar, PA 16848

Mailing Address: Lamar Fish Technology Center  
P.O. Box 75  
Lamar, PA 16848

Telephone: 570/726 4247  
Fax: 570/726 7247  
Email: [michael\\_hendrix@fws.gov](mailto:michael_hendrix@fws.gov)



# *Lamar Fish Technology Center*

## **Technical Staff & Expertise Center Director (RFC)**

- Atlantic salmon culture
- Administration

## **Fishery Biologist (Section Chief) (FTC & NFH)**

- Warmwater fish culture
- Coolwater fish culture
- Coldwater fish culture
- Saltwater recirculation

## **Fishery Biologist (FTC)**

- Sturgeon culture
- Water chemistry
- Saltwater recirculation
- Wetland development

## **Population Dynamics (Section Chief)**

- Experimental design
- Statistical analysis
- Population structures
- Impacts on wild populations
- Aquatic species interactions

## **Fishery Biologist (FHC)**

- INAD applications, field investigations, and monitoring
- Coldwater fish culture
- Coolwater fish culture
- Interpretive programs (outreach)

## **Fishery Biologist (Section Chief)(FHC)**

- Virology
- INAD Coordinator
- Diagnostics
- Disease treatment

## **Fishery Biologist (FHC)**

- Bacteriology
- Diagnostics
- Disease treatment

## **Fishery Biologist (FHC)**

- Parasitology
- Diagnostics
- Disease treatment



# *Mora Fish Technology Center*



*Top left: Trout broodstock. Top right: Recirculating system water filter.  
Bottom left: Quarantine tanks. Bottom right: Rearing tanks.  
All photos USFWS*

# *Mora Fish Technology Center*

## **Areas of Specialization:**

### **Fish Culture**

- Growth and production in warmwater and coldwater
- Broodfish development
- Transport and handling
- Quarantine and health management

### **Water Reuse**

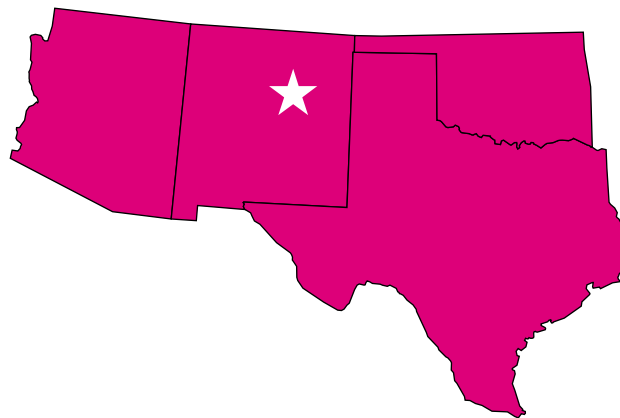
- Environment and bioengineering
- Physiology, toxicology and water quality
- Performance tests
- Disease treatment protocols
- Aeration and oxygenation

### **Threatened and Endangered Species**

- Production for population restoration
- Specialized and modified culture techniques
- Fitness and performance tests
- Broodfish management
- Diets for larval fishes

### **Research and Development**

- Technical assistance for hatchery modifications
- Water reuse system modifications
- Genetic analysis and monitoring
- Genetic protocols and policies



# *Mora Fish Technology Center*

## **Objectives**

- National and international fish culture, aquaculture technology, and propagation evaluation
- Conserve genetic resources through genetic initiatives, management guidelines, and protocols
- National and international water conservation technology and high density fish production with limited water
- Applied research and development for recovery and restoration of Rio Grande cutthroat trout, Gila trout, razorback sucker, bonytail, and other species
- Technical expertise in genetics, fish propagation techniques, water conservation and reuse technology to benefit fish culture of native and threatened and endangered species
- Develop new and innovative fish culture technologies to produce quality fish for conservation and management programs
- To provide leadership in the management of fishery resources through the assessment and evaluation of hatchery products
- To work with various federal and state agencies, tribal, sport, and conservation groups to provide fishery resources for the present and the future

## **Address**

Street Address: U.S. Fish and Wildlife Service  
Mora Fish Technology Center  
2 miles north of NM518 on NM434  
Mora, NM 87732

Mailing Address: U.S. Fish and Wildlife Service  
Mora Fish Technology Center  
P.O. Box 689  
Mora, New Mexico 87732

Telephone: 505/387 6022

Fax: 505/387 9030

Email: FW2\_FR\_Mora@fws.gov Mora Fish Technology Center

Web address: <http://southwest.fws.gov.statelinks/nmlinks.htm>



# *Mora Fish Technology Center*

## **Technical Staff & Expertise**

### **Center Director**

- Genetics and fish culture of sport, threatened, and endangered fishes
- Physiology, transport, handling, and stress reduction of fishes
- Hatchery product evaluation, performance testing, and integrated fisheries management
- Water reuse and conservation technologies

### **Assistant Center Director**

- Program management and development
- Personnel management and development
- Performance and fitness testing
- Water reuse technology development

### **Water Quality and Chemistry**

- Water chemistry
- Disinfection and sterilization
- Water recirculation
- Water conservation

### **Biostatistician**

- Experimental and sampling design
- Statistical applications
- Data analyses
- Technical hatchery outreach

### **Fish Biologist**

- Rio Grande cutthroat trout culture
- Bonytail culture
- Gila trout culture
- Water management

### **Fish Culturist**

- Rio Grande cutthroat trout culture
- Bonytail culture
- Gila trout culture
- Water management

### **Bioengineer**

- System design and development
- Stress mitigation
- Water conservation

### **Fisheries Medicine**

- Disease diagnostics and treatment
- Wild population surveys
- Disease prevention technologies

### **Fish Culturist**

- Fish quarantine
- Fish culture development
- Fish culture

### **Systems Maintenance**

- Electrical system development
- Systems modifications
- Water systems analyses



# *San Marcos Fish Technology Center*



*Top left: Texas wildrice with wind-pollinated flowers. Top right: Zooplankton harvester developed by San Marcos Technology Center staff members. Bottom left: Texas blind salamander. Bottom right: Southwest Texas State University Biology Department undergraduate students, part of San Marcos diversity program, observing endangered fountain darters in aquarium. All photos USFWS*

# *San Marcos Fish Technology Center*

## **Areas of Specialization:**

### **Technical expertise**

#### **Refugia**

- Fishes, salamanders, aquatic plants, aquatic invertebrates

#### **Aquatic Animal Culture**

- Broodstock development
- Spawning methodology
- Specialized egg incubation techniques
- Life history
- Live food production

#### **Plant Management**

- Aquatic plant culture
- Aquatic plant restoration
- Aquatic plant control
- Native plant culture
- Prairie restoration

#### **Rearing System Design**

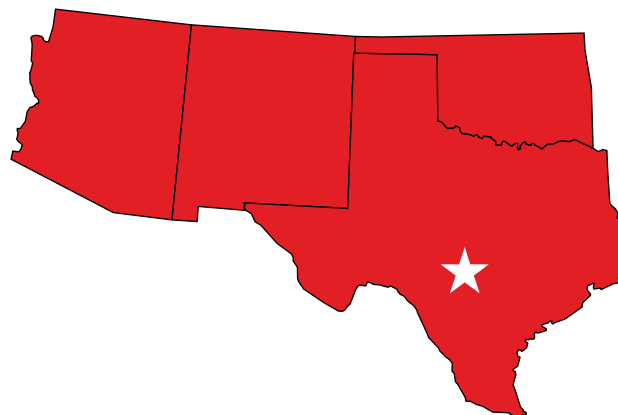
- Small-scale reuse
- Manipulation of dissolved gases
- Non-traditional biofiltration
- Artificial habitat development

#### **Education & Outreach**

- Graduate student training and research
- Community partnership development
- Nuisance species awareness

#### **T & E Species Management**

- Recovery planning
- Habitat-related research
- Emergency response planning



# *San Marcos Fish Technology Center*

## **Objectives**

- Collect, maintain, and propagate Texas wildrice, salamanders, and fish as outlined in the USFWS San Marcos/Comal/Edwards Aquifer Rare, Threatened, and Endangered Species Contingency Plan
- Conduct research on life history, ecological requirements, genetics, and culture
- Conduct research on restocking refugium species
- Collect biological information on the region's aquatic biological resources
- Troubleshoot problems at other hatcheries
- Train hatchery personnel, graduate students, and community groups
- Present research findings to aquatic community through refereed publications

## **Address**

Street Address: U.S. Fish and Wildlife Service  
National Fish Hatchery & Technology Center  
500 East McCarty Lane  
San Marcos, TX 78666

Mailing Address: U.S. Fish and Wildlife Service  
National Fish Hatchery & Technology Center  
500 East McCarty Lane  
San Marcos, TX 78666

Telephone: 512/353 0011  
Fax: 512/353 0856  
Web Address: <http://www.southwest.fws.gov>  
Email: fw2 fr sanmarcos@fws.gov

# *San Marcos Fish Technology Center*

## **Technical Staff and Expertise**

### **Center Director**

- Program management and development
- Fish feeds and nutrition
- Darter life history and culture
- Fish reproduction manipulation
- Centrarchid culture

### **Fishery Biologist**

- Invertebrate culture
- Salamander culture
- Fish culture
- Experimental design/statistics
- Computer technical support

### **Biological Technician**

- Stream ecology
- Invertebrate biology
- Reuse system modification

### **Plant Ecologist**

- Native terrestrial plant culture
- Aquatic plant culture
- Aquatic habitat restoration
- Prairie restoration
- Plant collections
- Outreach programs and partnerships



# *Warm Springs Fish Technology Center*



*Top left: Sturgeon egg staging. Top right: Spawning robust redhorse suckers.  
Bottom left: Paddlefish. Bottom right: Collecting blood sample. All photos USFWS*

# Warm Springs Fish Technology Center

## **Areas of Specialization:**

### **Culture of Aquatic Species**

- Propagation and refugia
- Water treatment and reuse
- Survival and performance
- Broodstock management transport and handling

### **Technology Development Transfer**

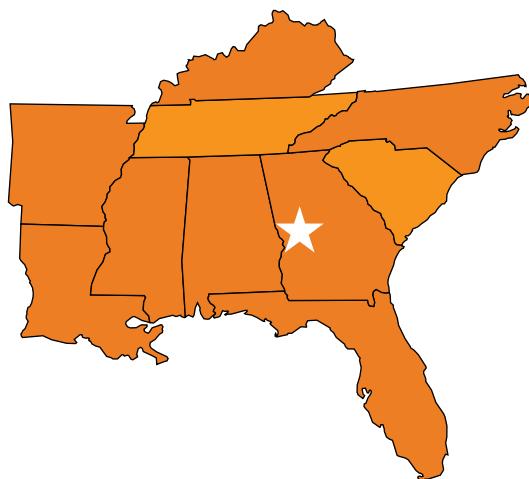
- Techniques for T&E species
- Cryopreservation of gametes
- Reproductive physiology
- Genetic management
- Population management

### **Health and Nutrition**

- Wild fish populations
- Alternatives to drugs
- Improved diagnostics
- Fish nutrition and health
- Contaminants

### **Evaluation**

- Recovery and restoration
- Life history requirements
- INAD monitoring and application
- Hatchery product evaluation
- Experimental design



# Warm Springs Fish Technology Center

## Objectives

- Develop fish management and culture methods for depleted native fishes, and other aquatic species, with particular focus on interjurisdictional freshwater and estuarine species
- Develop methods for evaluating and improving the survival and performance of hatchery reared species
- Determine abundance, distribution, life history, and environmental impediments for assessing depleted fish populations, as part of a management plan for restoring aquatic species, including important recreational fisheries
- Develop innocuous alternatives to traditional fishery drugs and chemicals
- Evaluate water treatment technologies with emphasis on water conservation and physiological requirements of fish
- Develop and apply cryogenic techniques used for reproductive biology, as applied to recovery and restoration of depleted fish populations
- Develop improved culture techniques for captive refugia, as well as new methods for assessment and enhancement of post-stocking survival of native threatened or endangered aquatic species
- Develop new non-lethal diagnostic sampling techniques to assess the health of fish and fish populations, as part of a national initiative to characterize the health status of our native fishes in the wild
- Establish a gene-bank for retaining important genetic material as needed for the continued protection of valued aquatic biological resources in the southeast
- Present scientific findings to aquatic resource community, through publication in scientific journals, FWS documents, and presentations at technical workshops, and institutions of higher education

## Address

Street Address: Warm Springs Regional Fisheries Center  
5308 Spring Street  
Warm Springs GA 31830

Mailing Address: Warm Springs Regional Fisheries Center  
5308 Spring Street  
Warm Springs GA 31830

Telephone: 706/655 3382  
Fax: 706/655 9034  
CC:MAIL: R4FR\_WSGA

Bears Bluff Unit (NFH)  
P.O. Box 69, 7030 BB Road  
Wadmalaw Island, SC 29487

Telephone: 803/559 2315  
Fax: 803/559 3002



# *Warm Springs Fish Technology Center*

## **Technical Staff & Expertise**

### **Center Director**

- Fisheries biology
- Water quality
- Bioengineering

### **Fishery Biologist**

- Fish Culture—warm and coldwater species
- Broodstock development
- Fish transport and handling

### **Genetics Specialist**

- Regional fishery support
- Population genetics
- Genetic techniques

### **Fishery Biologist**

- Reproductive biology
- Cryogenic techniques
- Gene-banking

### **Fishery Biologist**

- Quality assurance/quality control
- Water quality
- Water treatment systems



# *Warm Springs Fish Technology Center*

## **Technical Staff & Expertise**

### **Vincent A. Mudrak, Center Director (RFC)**

- Fisheries biology
- Water quality
- Bioengineering

### **Gregory L. Looney, Fishery Biologist (FTC)**

- Fish Culture —warm and coldwater species
- Broodstock development

### **Transport/Handling Fish, Vacant, Genetics Specialist (FTC)**

- Regional fishery support
- Population genetics

### **Genetic Techniques, William Wayman, Fishery Biologist (FTC)**

- Reproductive biology
- Cryogenic techniques

### **Gene-Banking, Carlos Echevarria, Hatchery Manager (NFH)**

- Endangered species
- Water reuse technology

### **Sturgeon Reproduction, Haile L. Macurdy, Asst. Hatchery Manager (NFH)**

- Fish culture
- Fish transport/handling

### **Broodstock Fish, Kent Ware, Fishery Biologist (NFH)**

- Fish culture
- Fish transport/handling

### **Broodstock Fish, Malcolm Mohead, Fishery Biologist (NFH)**

- Fish culture
- Fish transport/handling

### **Broodstock Fish, Norm Heil, Fish Health Biologist (FHC)**

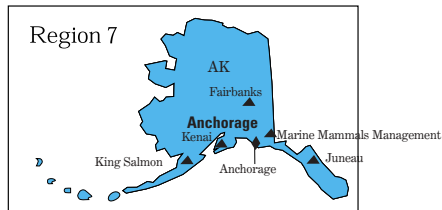
- Fish disease diagnostics
- Fish health and INADs

### **Grass Carp and Triploidy, Dr. Robert Bakal, Veterinarian (FHC)**

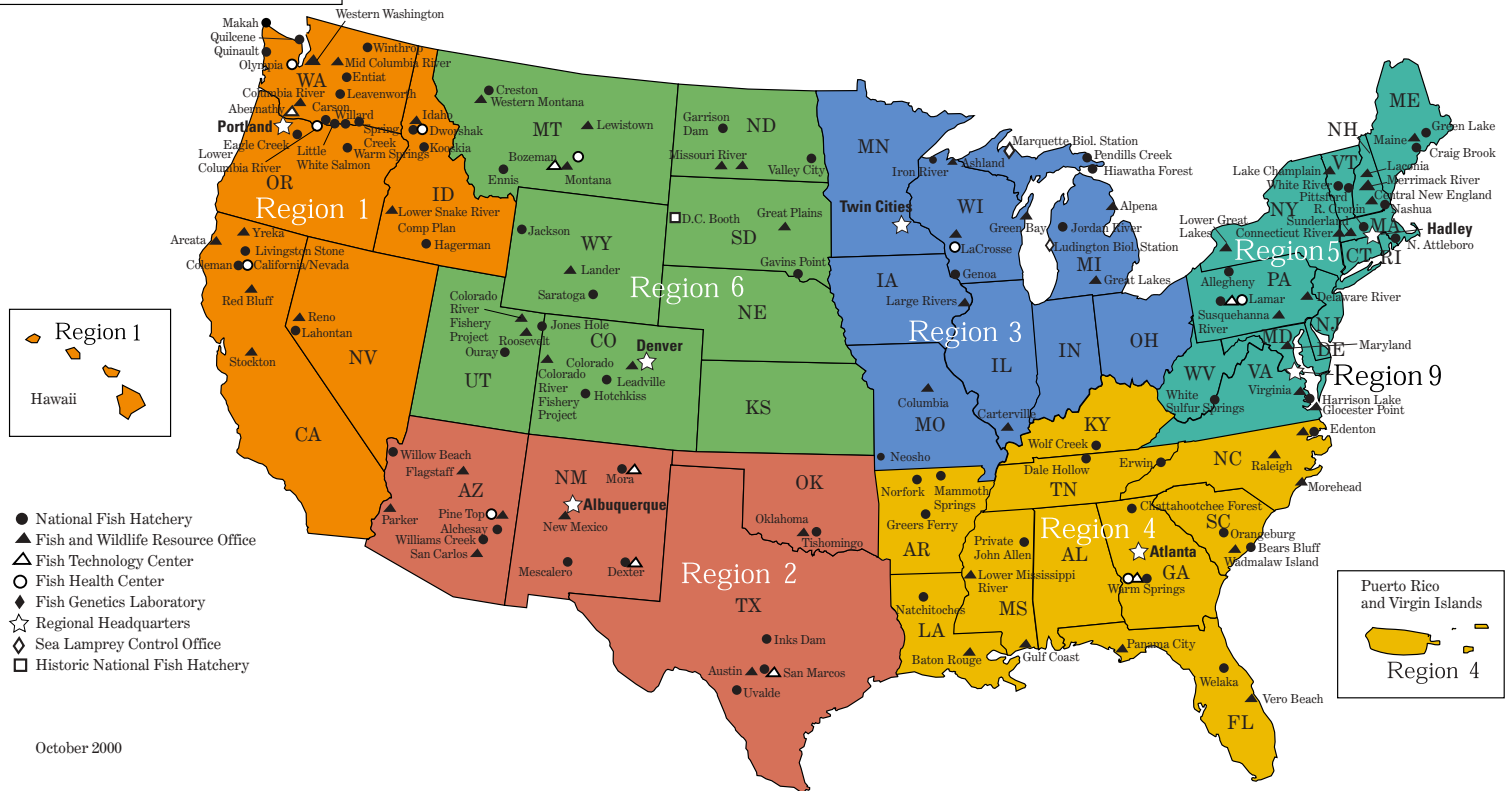
- Non-lethal sampling
- Vaccines

### **Quarantine, Brian Hickson, Fish Health Biologist (FHC)**

- Fish disease diagnostics
- Fish health and INADs
- Computer operations



## U.S. Fish and Wildlife Service Fisheries Program Facilities



The separate regions within the U.S. Fish and Wildlife Service require the services of fish hatcheries and fish health centers, in addition to fish technology centers. For this reason, often fish technology centers, hatcheries, and health centers will be organized as a complex and will be located all on the same site or near one another. This allows administration of the facilities to be simplified, in addition to enabling hatcheries, technology centers, and health centers to work together easier. Co-location of the facilities allows easier communication of research personnel, which improves the operation of all the facilities involved.

The Northeast Fishery Center and Warm Springs Fishery Center are both complexes. The combination of services they provide to their regions allows them to effectively ensure healthy, balanced fish populations in their areas, and better, more efficient service to the American people.

**U.S. Department of the Interior**  
**U.S. Fish & Wildlife Service**  
**1 800/344 WILD**  
**<http://www.fws.gov>**

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